DRIVER

OCTOBER 1979

SPECIAL SECTION

the freezin' season

carsmanship in the WINTERTIME

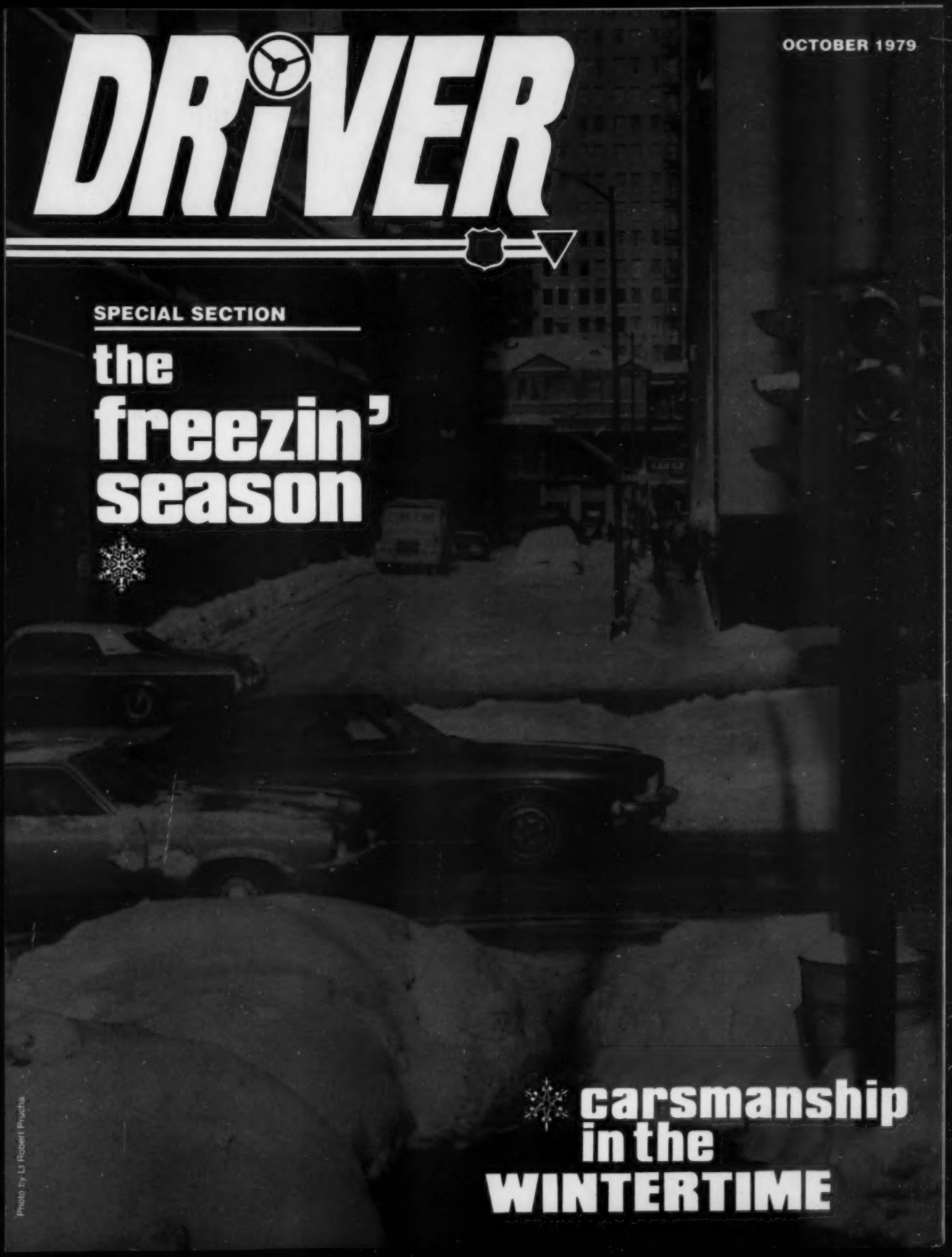

Photo by Lt Robert Prucha

DRiVER

special section

snowy weather driving

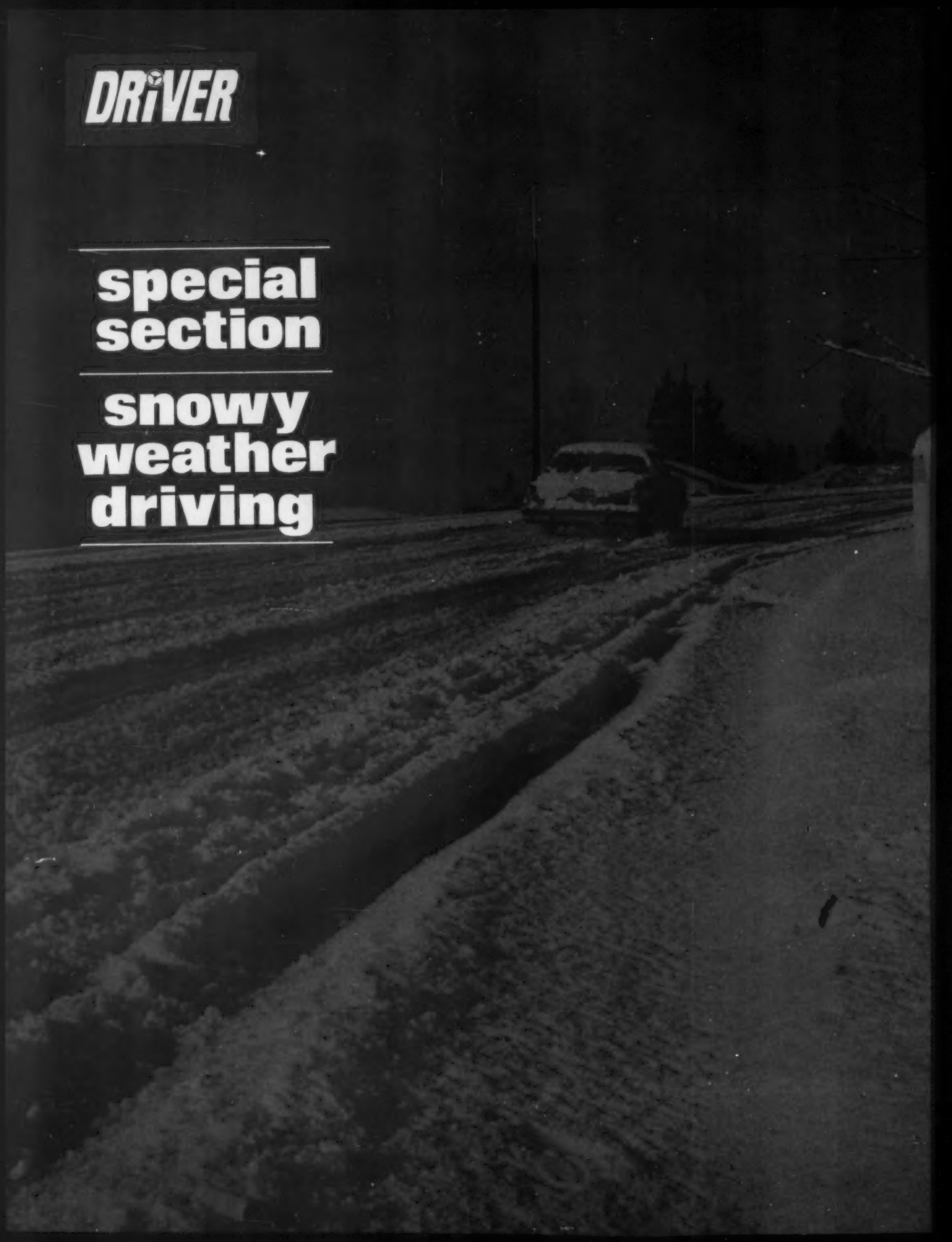

Photo by Lt Robert Prucha

Photo by Lt Robert Prucha

Commercial television aside, Mother Nature does not bring on winter when she confuses her favorite brand of margarine for butter. It's something she causes every year, without fail. Come October or November, she'll drop lots of ice and snow on you; you can count on it.

So why, if it's expected, are so many people surprised when it happens? They hurriedly put their snow tires on the car, only to discover they're inflated only to 14 psi. They try to start the car at 10 below zero, only to find that weak battery they were going to replace has coughed and crackled its last.

That's bad enough. But how about the types who accelerate to the legal speed limit on icy roads and then expect their brakes to stop them safely in a short distance? Especially those who have lived in wintry climates for years–are they dense or do they just not think?

We want you to be ready for the coming winter, so we've prepared some information on cold-proofing your car and your driving habits. Get busy now, before the mittens-and-earmuffs weather begins!

preparing for winter

Pity the poor automobile. It runs most of the year with little or no maintenance and then is asked to start on that first sub-zero morning with no complaints. Is it any wonder so many cars balk and refuse to cooperate?

Cars and people thrive on attention and tender loving care. Your girlfriend/boyfriend is much nicer to you if you pay attention to her/him. Think of your car the same way–well, almost the same way.

Get the lead out: Let's just start with cleaning. Before you go on to winter you'll want to get some of summer's junk/equipment out of the car. You'll need room for the special required winter stuff. Clean the car inside and out, and empty the trunk of all but the mechanical necessities–the spare tire, jack and tools.

Check out those items. Is the spare in good condition and properly inflated? Does the jack work?

Now about those tools. You may have taken some of them in the house to repair the sink. Make sure you put back in your car what it may need. This will include an adjustable wrench and a pair of pliers, a few assorted screwdrivers, a roll of electrician's tape and a spool of medium gauge wire. These last are very good for temporary repairs.

Good windshield wiper blades are vital in winter, when visibility is so poor.
Photo by SSgt Dwight Williams

You should also carry some spare parts and fluids in the trunk (but NOT gasoline). Pack in some spare bulbs and fuses, a fanbelt, a couple of cans of oil, some coolant, some brake fluid, and some power steering fluid and automatic transmission fluid, if you use them. Windshield wiper fluid and spare blades are also nice to have when you need them, which you might.

Road flares or reflectors will warn other motorists that you've broken down, and they'll signal that you need help. A flashlight and extra batteries are also good to carry.

If you do get stuck in the snow, you may be able to get out by yourself if you have the right stuff. First, a shovel. You can use that to dig out the wheels, etc. Then, for traction, you can use salt or sand. If you carry these, carry only a small quantity because they weigh a lot.

We've found that kitty litter (you heard right) works very well to provide traction. It doesn't weigh a lot, and it

continued

DRIVER

THE
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THE EDITOR SPEAKS
DOUBLE CLUTCH

IS THERE AN RV IN YOUR FUTURE?

Does the high cost of gasoline mean the end of recreational vehicles such as motor homes? Probably not, but it certainly means that RVs will be different.

The best opportunity for improving RV fuel economy is through improved aerodynamics and reduced weight, according to R. H. Kline, who is Sales Manager-Recreation Vehicles at Chrysler.

There are two ways to improve the aerodynamic drag on a motor home. First by reducing the frontal area, and second through more sophisticated design. In the past, some class A motor homes were 90 inches wide. In recent years almost all are out to the 96-inch legal limit in the manufacturer's search for maximum space and value. Now, says Kline, RV manufacturers are going to have to re-think these dimensions and floor-plan designers must become more ingenious.

Height is also important, and one way to make gains here is to clean up the roof. If the vents and air conditioner can be integrated, the vehicle would have lower drag and look better, too. Kline thinks the floor also could be lowered.

The other major variable the RV manufacturer controls is weight. On a typical 12,000 gross-vehicle-weight motor home, the chassis weighs about 4,000 pounds, the body about 6,000 pounds, and the payload about 2,000, so it's the body builder who has the greatest opportunity to lighten the total vehicle. Techniques and materials used by the aircraft and automotive industries offer some good weight-saving ideas, but the trick for the RV manufacturer is to use them without automotive or aircraft tooling costs.

continued on page 19

cleans up easily if you spill it in the trunk. It may also help if you find a stray cat you want to keep.

What else for the trunk? A tow rope or chain, a blanket and first aid kit, and perhaps a set of tire chains, some gas line anti-freeze, and a set of jumper cables.

Charge! That last item reminds us of the battery, which brings us to maintenance and preparation for the winter. And the battery is as good a place to start as any. If your battery is weak you should consider getting a new one, or at least having it charged. That way, it'll crank the engine more easily – and easy starts are often a problem in winter.

Ice will form on bridges when the rest of the road is dry. And ice will remain frozen on the bridge when the roads start to thaw. Photo by Lt Robert Prucha

Here is your basic good person, brushing all the snow off his car so he can see out. He has a brush with a scraper on one end, a handy tool for winter use. Photos by Sgt Dwight Williams

To assist the easy starts, think about the last time your car was tuned up. If it's been around 10,000 miles, go hunt for the spark plug wrench. A nicely tuned engine and a charged-up, powerful battery will make your mornings a lot more pleasant, even when the weather tries to ruin your dispostion.

Also, if it's been more than 6,000 miles since your last oil change, now's the time. Which weight oil you put in will depend on the temperatures you'll encounter. Generally, you should use a lighter-weight oil than you would in the summer, or a multi-viscosity oil. We've included a chart on page 7 that will help you decide which oil to choose.

Other things to check under the hood are the windshield washer solution, of which you'll probably use a goodly amount, and the anti-freeze (or coolant as it's called these days). If the coolant is old, it will still protect against freezing, but it may have lost its ability to inhibit rust in the radiator. So it may be wise to flush the radiator and fill it with fresh coolant, mixed with water according to the instructions on the container. Get any leaks in the cooling system fixed *now*.

Your windshield wiper blades are especially important in winter. They should be in good condition – if they leave streaks, replace them.

You'll also need your heater and defroster to keep that snow from freezing on the windshield when you're driving (and to keep you warm). Check them out now.

Another thing to check out is the exhaust system of the car. Any rust spots could mean the whole thing is about to go out to lunch. Replace anything that leaks or is rusty. You may not get another chance to see to it for a while, and a leaky exhaust system could pump your car full of poisonous carbon monoxide.

While your car is up on the hoist you should look at the brakes. Replace any worn pads/shoes, because as we said you may not get another chance for a while.

And before you let the car down, it wouldn't hurt to give it a good lube. After all, that's what the hobby shop is for – to enable you to care for your auto.

Re-tiring: The kind of tires you use will depend on where you live. If your area doesn't get much snow, or none at all, you may be okay just staying with your regular tires. But most of the country gets enough snow to make it worth your while to think about snow tires. Snow tires have deeper grooves and thicker treads to give you traction on snowy surfaces.

And they do this job very well. There are bias-ply snow tires and steel-belted radial snow tires. You can get whatever type you prefer, but remember: Don't mix radials and non-radials on the car. If you have radials on the front, don't get bias-ply snow tires.

This is the reason: Radials have a more flexible sidewall than conventional tires, which causes them to look

continued

a little flat even when fully inflated. A mix of radials and non-radials could cause you some handling difficulties, because the radials are more responsive to changes in direction.

Snow tires with studs have become a highly debated item. Some states and countries have banned them entirely because of the damage they do to the streets and highways, and other states allow only the so-called "soft studs." Most states that allow them set a time limit for their use, for instance between November and April. We've provided a list of the state regulations on studs, but check with local law enforcement authorities just to be sure.

Several companies now manufacture "all-season" tires that are designed to be used on regular dry roads but can perform well on snow and ice. These are another possibility you may want to examine.

But PLEASE don't fall for that old idea that you can get additional traction by letting some air out of your tires. This will make the car's handling suffer, and the tires will wear out faster if they're under-inflated. That's false economy. Buy some snow tires.

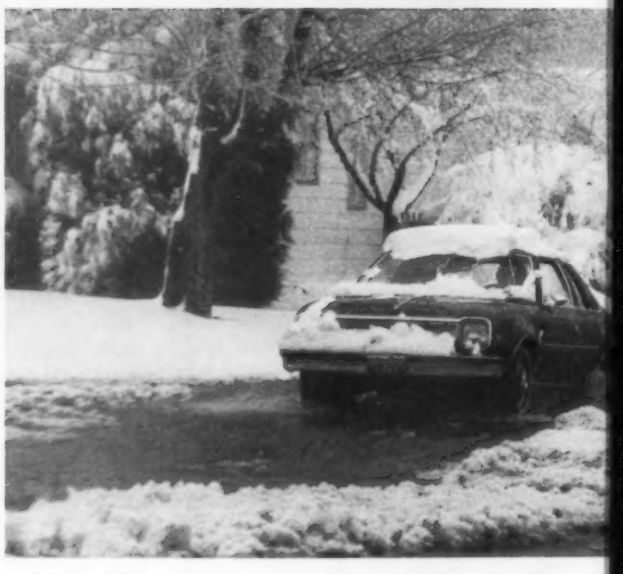
If you'd like any more information on tires, take a look back at the January 1979 DRIVER, with our "Tire Roundup" article.

We've already mentioned tire chains, but we'll just add that they give the best traction for the least expense. They are not as difficult to attach as you may think, but they could be a hassle if the weather warms unexpectedly and all the snow melts. *You* decide between chains and snow tires, but "neither" isn't a good idea.

Sometimes all else fails and you have to ask for a push out of the drift. At times like this, it's nice to be in a carpool.

Photo by
Capt Dennis Pierson

driving in



Not only did this person fail to clear all the snow off the top of the car, he also left one headlight covered. This is *not* recommended.

Photo by
SSgt Dwight Williams

There is a way to be completely safe from the hazards of winter roads and that's to stay indoors until April. Unfortunately, that solution would cut down severely on your earning power. The cold is out there and you have to face it, so listen up as you struggle into your coat and gloves. We'll let you know how to (pardon the pun) skate through the season.

Safe driving in winter requires a well-cared-for machine, which you can give yourself by reading the previous article, and patience on your part. Patience because this is the season for sliding around. And for digging and shoveling. And scraping and brushing. And all that takes a lot of time and therefore tries your patience.

You'll have an easier time if you're one of those favored few who have a garage. This will take care of one of the greatest headaches in winter—starting up. No ice and snow to remove.

Be prepared to get yourself out of a skid. Steer your front wheels into the skid—if the tail of the car slides left, steer left, and if it skids right, steer right.

winter

Slush like this can be just as slick as ice or snow. Keep your speed down.
Photo by SSgt Dwight Williams

The car (relatively) warm. Even a carport can help here. If you have one or the other, grab another cup of coffee and skip down a bit.

For the rest of us, it's "Go outside and look for a white lump in the shape of your car."

One headache you can avoid, or minimize, is ice on the windows. If you cover the windows with a tarp, you can whisk it off in the morning and start the car with little or no scraping. A complete car cover is great, if you have the money.

Digging out: Let's get to it. First, brush all the snow off the car. Yes, *all* of it. If you leave some on the top or the trunk, it'll blow off as you drive and make you unpopular with the other drivers as they try to see through the cloud. Then get inside, start the engine and turn on the defroster to help you get the ice off the windows.

That's fine most of the time, but you may be plagued occasionally with frozen doorlocks. This can be handled with a cigarette lighter or a match, which you can use to heat the key enough to thaw the lock. Another idea that was suggested to us is to use ethylene glycol antifreeze. If you carry a small amount in a pill bottle, you can dip the key in it and insert the key into the lock until the solution removes the ice inside. (One other hint: Keep the bottle in your coat pocket, not the glove compartment. You might forget it and have it locked inside the car, with you locked *out*.)

Once you've got the defroster helping you, scrape the ice off all the windows. Some people just scrape the windshield or a spot right in front of the steering wheel, but you need to see in all directions, especially on those dark winter mornings. It takes a little longer to clear all the windows but it's worth it.

When you get inside, you'll find the car is probably warmed up nicely, and

continued

Accelerate slowly from a stop; racing the engine will only make the wheels spin.

Snow tires, with their thicker, deeper treads, provide better traction on winter's slick road surfaces.

you are too, from the exertion of cleaning off the car. Now here's where the patience comes in – the driving part. You can have a safe trip by keeping your patience and going slowly.

Start early or arrive late: That's your choice. Take one or the other, because you won't make up time on the road – you have to go too slowly. You can't start out fast, you can't stop fast and you can't turn fast, so don't get antsy.

To move the car, apply very light pressure to the accelerator. If you press too hard, the wheels won't catch because snow and ice make for lousy traction. Many people seem to think if they can't get going, more power is the answer. That's why you see so many spots of polished ice at intersections – drivers try to gun their engines to move quickly. Mostly they fail. Give your tires a chance to get what little traction the snow offers by starting slowly.

While you drive, keep your speed down. The posted speed limits are for dry and clear weather, not for the slippery winter conditions. You've heard the expression "speed too fast for conditions" given as a reason for an accident? That's what they mean.

Elbow room: Allow more room around you because you can't be sure when someone else will do something dumb and go skidding. Don't follow as closely as you would the rest of the year. If an emergency occurs, it'll take you longer to get the car to respond on slick roads.

Anticipate your moves. If you'll be turning at the next corner, begin to slow down far ahead of the time you'd slow on dry pavement. Ease up on the gas pedal. Apply only light pressure to the brakes, and pump them to insure the wheels aren't locked. If you lock the wheels, chances are you'll begin to skid. Do all your braking before you begin the turn; otherwise a skid is likely.

Stopping requires the same procedures. Begin to brake earlier and do it more gradually than you would on dry streets. In winter, a heavy foot on the brakes will provide you with much more excitement than you really need.

Skidding: And while we're on "excitement," let's mention skidding and tell you how to handle it. Skids are usually caused by driving too fast for conditions, or from locking the wheels when you're slowing. But you could be driving along at a sensible rate on snow and simply hit a patch of bare ice.

However it happens, you'll want to get the skid stopped as quickly as you can. It's pretty easy, if you remain cool and don't get excited. First, you ease off the accelerator; slowing down will assist you. Then, you turn into the skid. That is, if your car's tail end slides to the left, turn your steering wheel to the left (and right for right skids). Pump your brakes if necessary; don't lock them. When the car begins to come out of the skid, straighten out the front wheels. Be careful not to oversteer, or you'll have a skid in the opposite direction and you'll have to steer out of *that* one. (Remember front-wheel drive vehicles are engine-braked from the front. Touch the accelerator just a little – to keep the front wheels ahead of the back ones – and steer into the skid. Or else take the car out of gear.)

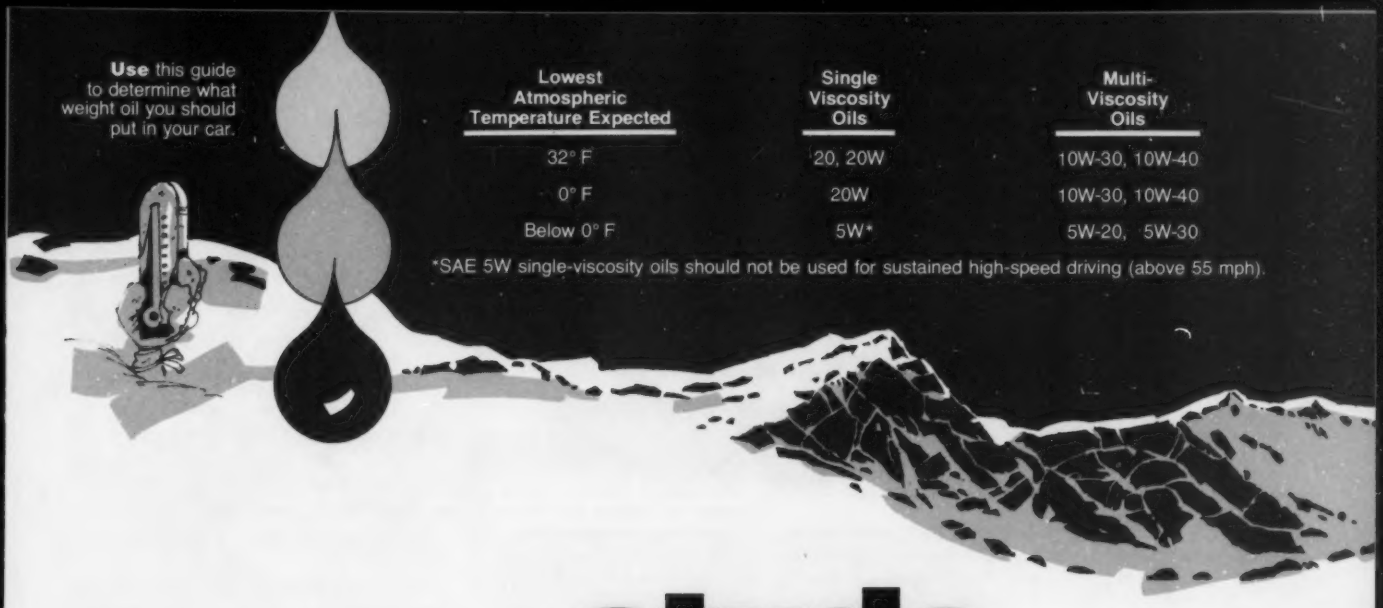
Let's say that you lose it and skid off the road. Or that you're stuck in your parking lot in the morning. Any place with snow all around. If you get stuck you can usually get out by rocking the car. You shift from reverse to drive (or first gear for manuals) and back again until you come out of the snow and are able to move on. Again, apply only light pressure to the accelerator.

If you're *really* stuck, you have to dig out. Get out the shovel and clear the snow away from the car, especially around the wheels. Provide the wheels with a gentle incline out of the drift. Try rocking the car, but if that doesn't

Use this guide to determine what weight oil you should put in your car.

Lowest Atmospheric Temperature Expected	Single Viscosity Oils	Multi-Viscosity Oils
32° F	20, 20W	10W-30, 10W-40
0° F	20W	10W-30, 10W-40
Below 0° F	5W*	5W-20, 5W-30

*SAE 5W single-viscosity oils should not be used for sustained high-speed driving (above 55 mph).



states and studs

This information regarding the use of studded tires was taken from a special notice issued by the American Automobile Association. Dates refer to time periods during which studs may be used.

Alabama—No restrictions
Alaska—September 15-May 1
Arizona—October 1-May 1
Arkansas—November 1-April 30
California—October 1-May 1
Colorado—No restrictions
Connecticut—November 15-April 1
Delaware—October 15-April 15
District of Columbia—October 15-April 15
Florida—Metal-studded tires are prohibited; rubber studs are permitted.
Georgia—No restrictions
Hawaii—Prohibited
Idaho—October 1-April 15
Illinois—Completely banned
Indiana—October 1-April 30
Iowa—November 1-April 1
Kansas—November 1-April 15
Kentucky—No restrictions
Louisiana—Completely banned
Maine—October 2-April 30
Maryland—October 15-April 15
Massachusetts—November 2-April 30
Michigan—State-approved "soft studs" permitted November 15-April 1; northern regions permitted October 1-May 1.
Minnesota—Prohibited, except out-of- state vehicles may use studded tires for 30 days.
Mississippi—Completely banned
Missouri—November 1-March 31
Montana—October 1-May 31
Nebraska—October 1-April 15
Nevada—September 1-April 30
New Hampshire—No restrictions
New Jersey—November 15-April 1
New Mexico—Permitted only when required for safety and stopping purposes.
New York—October 16-April 30
North Carolina—No restrictions
North Dakota—October 15-April 15
Ohio—November 1-April 15
Oklahoma—November 1-April 1
Oregon—November 1-April 30
Pennsylvania—Prohibited
Rhode Island—Prohibited
South Carolina—No restrictions
South Dakota—No restrictions
Tennessee—No restrictions
Texas—Metal-studded tires are prohibited; rubber-studs are permitted.
Utah—Only tungsten carbide soft studs permitted October 15-March 31.
Vermont—No restrictions
Virginia—October 15-April 15
Washington—November 1-April 1
West Virginia—November 1-April 1
Wisconsin—Completely banned
Wyoming—No restrictions

CANADIAN PROVINCES

Alberta—No restrictions
British Columbia—October 1-April 30
Manitoba—October 1-April 30
New Brunswick—October 16-April 14
Newfoundland—November 1-April 30
Northwest Territories—No restrictions
Novia Scotia—October 15-April 15
Ontario—Completely banned
Prince Edward Island—October 1-May 31
Quebec—October 15-May 1
Saskatchewan—No restrictions
Yukon Territory—No restrictions

work scatter a little sand (or whatever you have) to give some traction. When you're pulling out of deep snow, keep your wheels pointed straight. If the wheels are turned, you'll probably put yourself right back in the snow.

We'll say it again: Be patient. Whether you're driving surrounded by incompetent clowns, or scraping three inches of ice off the car, impatience won't get you to your destination any faster. Patience won't get you there any faster either, but it'll sure make the trip more pleasant and safe.

Our thanks to Lt Robert Prucha of the Navy Office of Information, Chicago; Capt Dennis Pierson of Oklahoma City AFS, Okla.; and SSgt Dwight Williams, Photo Sciences Branch, Lowry AFB, Colo., for the snowy photos from around the country.

"It took Arnie all day to find a seven-pointed snowflake and you just ran over it!"

Ford Bronco, a family utility vehicle, offers improved driving ease and fuel efficiency with independent front suspension, four-wheel-drive capability. New body contours and use of lighter-weight but rugged materials contribute to the driving and fuel improvements.

SIZE
ECONOMY
PERFORMANCE

cars of the 80s

Transiting from cars of the '70s to those of the '80s may seem like going from dark into light. It's a move from advertisements stressing "bigger" and "more powerful" to marketing "down-sized" and "economical." The bottom line is still performance – performance measured in miles per gallon, not miles per hour or horsepower. In other words, there's light at the end of the tunnel.

True, the auto industry has been heading toward the end of the tunnel since the early '70s. But, it almost seemed as though there were no light at either end of the passage. The 1980 model domestic motor vehicles provide a glimpse of a brighter future.

And it's not just a bright future for cars. Recreational vehicles from trucks through 4x4s to motor homes have their own rays of tomorrow in the 1980 line-up.

This month DRIVER previews the new year line-up from Ford Motor Company, Chrysler Corporation and American Motors. Next month the 1980s of General Motors will fill a few pages. Look them over, not only on these pages, but in the show rooms. We think you'll agree – there is a light at the end of the tunnel.

Ford pickups offer higher levels of driver convenience along with improved fuel economy and lower scheduled maintenance costs. Environmental Protection Agency ratings run as high as 19 miles per gallon city and 29 mpg highway, with cruising ranges as far as 1,102 miles. A completely independent front axle is featured on four-wheel drive models.

Thunderbird, now in its ninth generation, can be teamed with an all-new four-speed Automatic Overdrive Transmission to improve highway fuel-economy 45 percent over 1979 T-Birds. The 1980 Thunderbird offers more interior room and more trunk space than its 1979 counterpart even though it's 700 pounds lighter.

(left) **Mercury Cougar XR-7** is all-new for 1980. The leading option, a four-speed Automatic Overdrive Transmission, contributed dramatically to a three-mpg improvement in highway fuel economy. Other new options include a Keyless Entry System for doors and the deck lid as well as a digital instrument cluster and graphic fuel-gauge display. (right) **Lincoln Continental** is offering an estimated 38 percent fuel-economy improvement based on anticipated EPA metrohighway figures. In addition to the new Automatic Overdrive Transmission, other efficiency-oriented innovations are the Electronic Engine Control System and electronic fuel injection. These are backed by an electronic instrument panel with computer-operated message center that displays 36 messages.

(above)
AMC Pacer coupled a 4.2 liter (258 cubic inch) six-cylinder engine to a new standard four-speed manual or optional three-speed automatic transmission to exceed both city and combined city-highway gas mileage figures of its 1979 counterpart. There is a hatchback model in addition to the wagon pictured here.

(above right)
AMC Spirit gets a 25 percent greater displacement standard four-cylinder engine. The larger 2.5 liter (151 cubic inch) powerplant provides greater performance and fuel economy. Spirit is available in liftback (shown) and sedan body styles.

AMC Concord receives numerous exterior changes for 1980 as well as a new 2.5 liter (151 cubic inch) four-cylinder which is slightly lighter than the 2 liter (121 cubic inch) model offered in 1979. Yet the new engine provides improved performance and comparable fuel economy. The Concord comes in 2- and 4-door sedans as well as the 4-door wagon pictured.

(left)
AMC's AMX has a G.T. rally-tuned suspension system as standard for 1980.

continued

AMC Eagle is a marriage of the luxury and convenience of a compact car with the superior traction and handling characteristics inherent in four-wheel-drive. American Motors says the "Eagle" is targeted for buyers who want maximum safety and security which four-wheel-drive affords, drivers whose occupational demands or recreational desires require travel under adverse conditions, and people who live in areas where travel often is difficult during stormy seasons. Standard equipment includes a 4.2 liter six-cylinder engine, 3-speed automatic transmission, automatic four-wheel-drive system, power steering, power brakes (disc front) and radial tires.

Jeep vehicles for 1980 offer increases in gas mileage as well as performance. There's a new four-cylinder engine standard for CJ's; a new 4-speed manual transmission replacing 3-speeds as standard on most models; new automatic transmission, and new automatic and part-time four-wheel-drive systems. The new, lighter powertrains are coupled with other drive-train changes to improve economy and performance throughout the lineup. And to improve the handling both on and off the road, the previously optional front stabilizer bar has been made standard on the Cherokee (shown), Wagoneer and pickup truck.

80 81 82 83 84 85 86 87 88 89 CHRYSLER

Dodge Omni's front-wheel-drive, four-door hatchback and 024 sport coupe are joined by the DeTomaso package option for the 024 in 1980. In addition to the red or yellow body colors, contrasting black lower body paint, front air dam, rear spoiler and black trim accents, the DeTomaso 024 has sport suspension and Goodyear GT Aramid belted radials.

(left) **Dodge Mirada** is over 400 pounds lighter and six inches shorter than intermediate Dodge specialty cars of previous years, yet provides greater inside room. Ride and handling are enhanced by power front disc brakes, 15-inch wheels, P195/75R15 glass belted radial tires and front antisway bar. (right) **Dodge Diplomat** coupes and sedans are joined in 1980 by a sportified "S" type two-door. Halogen headlamps and a special handling package are features on this mid-size Dodge.

(left) **Plymouth Voyager** for 1980 is highlighted with better visibility and new side appearance resulting from a one-piece vented side window in the optional sliding passenger door. A greater choice of axle ratios and drive-line combinations provide better fuel economy. (right) **Dodge Ramcharger** has an all new part-time four-wheel drive system for 1980. The new transfer gear case, which is 80 pounds lighter than its predecessor, offers improved fuel economy, reduced driveline noise and improved front axle serviceability. A suspended accelerator pedal is also new. The pedal, suspended from a pivot that is attached to the dash panel, leaves the floor area clear and eliminates the debris-collecting pocket that was formed by the floor-hinged pedal.

Plymouth Gran Fury returns in the 1980 lineup. Standard features include semi-hidden windshield wipers, 21-gallon fuel tank and steering column-mounted control lever for windshield wipers and washers, headlamp beam selector and turn signals.

Chrysler LaBaron models for 1980 include two-door coupe, four-door sedan and four-door station wagon all equipped with a high-strength steel front bumper for the first time. Options range from the rear window washer/wiper for the wagons through brighter Halogen headlights to special handling packages including heavy-duty rear springs, heavy-duty shock absorbers and "firm feel" power steering.

Plymouth Volares are available in a diversity of dress-up packages and specialty models allowing buyers to design the two-door, four-door or station wagon to their life style. Included among these are the Premier (pictured) and Custom trim levels and the Duster, Road Runner and Sport Wagon packages. Handling Performance packages include firm-feel police power steering, extra heavy-duty suspension and Aramid-belted tires.

IT'S TIME TO "CRY HAVOC!"

DRIVER recently invited Joan Claybrook, the NHTSA Administrator, to write an article for us. She agreed, and here it is. Ms. Claybrook prepared her remarks especially for the 18-to-26 age group, but we think readers of all ages will be interested in how America's traffic safety problems look to the government official most concerned with doing something about them.

For the first time since the federal government assumed a major role in motor vehicle and highway safety 13 years ago, the highway fatality rate per million miles of travel increased last year. And for the first time since 1973, total traffic fatalities exceeded the 50,000 mark. Isn't it time, as Shakespeare put it, to "Cry Havoc"?

The number of Americans killed and injured each year in highway crashes dwarfs the casualties in all other transportation modes combined. Highway crashes are the leading cause of paraplegia and epilepsy. And the terrible cost to the nation of these accidents, deaths and injuries is now more than $45 billion each year. There is no greater public health problem in this country.

And who are the victims? Tragically they are so often our young people. More than 22,400 under the age of 25 died last year. And often these young Americans were at the wheel. Drivers in the 16-24 age group are involved in more than 39 percent of all highway crashes, and in 38 percent of fatal crashes.

The real tragedy is that so many of our highway deaths are unnecessary. They need not happen. They are preventable. All it would take would be a reasonable amount of prudence. Thousands of lives could be saved every year if drivers would follow three simple rules—do not drive when you've had too much to drink, always wear a helmet when on a motorcycle, and always fasten your safety belts in a car.

The difficulty is that each one of these preventive measures requires some change in individual behavior, and behavior change is extremely difficult to foster. And yet, we often hear that the highway safety problem is too big for one person to do anything about.

The problem of the drinking driver is the most difficult of the three issues. Fully half of our highway fatalities involve alcohol to some degree, but drinking has become so integral a part of our culture that no research to date has found a way to separate drinking from driving.

Our agency has had some small measure of success in appealing to those who do *not* drive after drinking. Our message is that we all have a responsibility to our family and friends to intervene when we see someone who has had too much to drink start to drive. We make a point that it is socially acceptable to intervene in such instances. We call a cab, drive them home, let them spend the night, or hide the car keys if necessary. Whatever action is needed, friends don't let friends drive drunk.

On the question of motorcycle helmets, the findings are perfectly clear. Helmets save lives. Under the stimulus of Federal safety standards, all but three states had mandatory helmet use laws in 1975. Then, in 1976, Congress took away our authority to impose sanctions against states which did not have a mandatory helmet law. Since that time, 26 states have either

by JOAN CLAYBROOK, Administrator
National Highway Traffic Safety Administration
U. S. Department of Transportation

repealed or weakened their helmet use laws. In 1977, there was a 24 percent increase in motorcycle deaths, which reached an all-time high of more than 4,100. They increased another five percent last year.

Other studies show that helmet usage in states with mandatory laws is about 94 percent, while in states without such laws, or in states which repeal their laws, usage drops to 60 percent or below.

The third and most frustrating problem of all is seat belt usage. Our latest data show that only about 14 percent of our motorists use their belts. Significantly, among those killed in crashes, new studies show belt wearing to be about 8 percent.

We estimate that 7,500 lives could be saved every year, if belt use could be increased to just 70 percent of motorists, but there is no known way to increase usage beyond about 20 percent, short of mandatory seat belt laws which until now at least have been out of the question for the United States. There is no public support for them, just as there was little support for the ignition interlock of a few years ago, which required seat belts to be fastened before the car would start. That device succeeded in greatly increasing belt usage, but public objections succeeded in getting Congress to abolish the interlock.

Fortunately, however, there is in this case an engineering solution to the problem—automatic restraint systems. Starting in model year 1982, automatic systems such as air bags or automatic belts will be required in the front seats of all full-sized cars, and by model year 1984, all passenger cars will be required to have automatic restraint systems. Our Standard 208 is a performance standard, which means that we do not require a particular device, but a level of protection which must be provided. The manufacturer is free to choose the device or the method of providing automatic protection.

We estimate that when all cars are so equipped, we will save 9,000 lives each year. Actually, some automatic systems are already available. Volkswagen offers an automatic belt system as an option in its VW Rabbit, and General Motors offers one in its Chevette. In addition, we have been told by various manufacturers that they will be offering either air bags or automatic belts as options on a wide range of models in 1981, a full year before they are first required.

The tragedy is that it has taken so long to get to this point. The government has been trying to get automatic restraint systems into cars since 1969. Opponents of these lifesaving devices have argued that in requiring these systems we are somehow depriving drivers and their passengers of some kind of right to die the way they choose. We believe that motorists now are being denied their right to choose the way they can *live*. And this is another case in which the public has been ahead of the industry. A study conducted for us last year shows that 58 percent of the people support Secretary Brock Adams' decision to require automatic restraint systems by 1984.

Also of immediate concern is the rapid move to smaller vehicles, as manufacturers look for ways to meet increasingly more stringent fuel economy standards for future model cars. The safety aspect of the problem is that as cars get smaller, they might also be less safe.

The Department of Transportation has just taken delivery of two prototype Research Safety Vehicles in a program which began in 1974. The purpose of the program is to demonstrate to the public and to the industry that advanced safety features can be designed into production cars by the mid-1980's, and that it is possible to design smaller cars that are at once safe, fuel efficient, low polluting, practical, and economical. The added bonus is that our research vehicles show that all this can be done in a vehicle which competes esthetically with the best products of Detroit. They are attractive, appealing vehicles.

Although some aspects of this research have already been put into some production cars, the superior performance of these research vehicles is not yet matched by any manufacturer.

Secretary Adams underlined the importance of basic motor vehicle research in his challenge to the auto industry and academic and research establishments to develop the necessary technology for major steps in automotive innovation by the turn of the century.

This is a critical necessity if we are to maintain the personal mobility of private automobiles for the forseeable future, without unacceptable burdens of safety hazards, pollution, and excessive fuel consumption.

These are times that demand sacrifices of us all, and what we end up doing and what we end up being is our common concern. Surely our ingenuity and resourcefulness will not fail to meet the challenge.

THE BACKWARD MECHANIC

(left) **Our Backward Mechanic** has a social conscience, too. Instead of hitching a ride with another gas hog, he has hooked on to a gas miser. the prime one being that the guy in front had better be going where you're going, or you aren't going to get where you're going to! (right) **Our hero** called "mileage-improving devices" on the market. Although forewarned that most of them aren't worth the time and expense, he's chosen to install Off.) from A.J. Jones, Inc.

First, a streamlined nose cone to let you "knife through the wind like a missle." He'd probably be better off with a good wax job.

(right)
Next come the "turbulence-cheating, specially designed, combination canard-wing-superfins." Although the "guaranteed-to-fit universal mounting method" didn't appeal to him, he was doing OK until his friend, Stud Tire, began to call the car "JAWS." Increased tire pressure (but within manufacturer's limits) and a good wheel alignment would have given him more miles per gallon.

For the final touch, an "econoturbocharger." Our hero had also read that turbocharging can increase mileage as well as power, so this device is really what sold him on the kit. He still refuses to talk about the time he tried to convert his emission-reducing smog pump into a supercharger. For better mileage, all he really has to do is alter his driving habits by avoiding fast starts, consolidating many short stop-n-go trips to one better-scheduled one, and not letting the engine idle for long periods.

COPING with a

miser. This method has its limitations though, **hero** has read that there are a bunch of so- nstall a set of GASPASSERS (notRegUSPat-

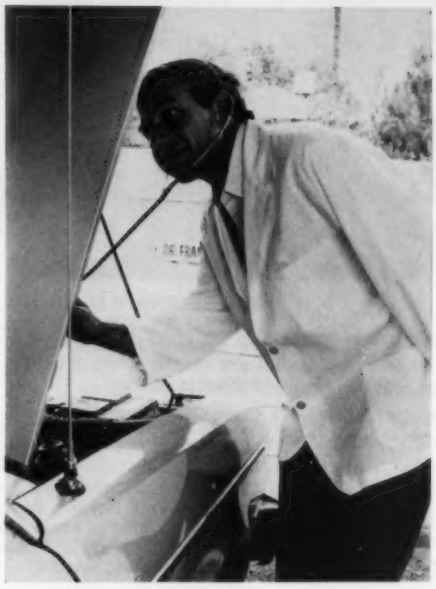
This year's gas crunch has come and gone, and we've all learned a few lessons about how to use fuel more efficiently . . . well, *most* of us have, anyway. Our fearless Backward Mechanic, though, he's another story. As a matter of fact, he's *this* story.

Since we all suspect there's another gas crunch coming in a few years (gotta get the price up to $2, right?) our hapless hero decided to put together a few tips on how to cope with future gasoline supply problems. Now, even the BWM will admit that all these tips won't work everywhere or every time, but he's convinced that several of them should pull you through.

For one thing, he's a firm believer in bribery, adhering to the old saying that "money will get you through times of no gas better than gas will get you through times of no money," whatever that means. You may also notice that there are no pictures of the tried-and-true method of supplanting your gasoline reserves with a "tubular plastic fuel removal and shuttle device," commonly called a siphoning hose. He feels that the two methods, bribery and out-and-out theft, are effective, although a bit unsporting, and he admits that both of them can put you in a world of hurt if not executed properly.

So, herewith, let us present to you, in pictures, the Backward Mechanic's tips on how to cope with a gas crunch.

(P.S., good luck . . . you'll need it!)



His good friend, Stud Tire, told him a tuneup would really help his gas mileage, so he went to the Discount Car Doctor. This clown flunked out of the Santo Loco School of Medi-chanical Knowledge when he kept asking the instructor, "Is this a 9- or 11-cylinder model?" The Discount Car Doctor tuned 'er up all right, to the tune of one spark plug and $65. A reputable tune-up center would have been a better deal.

continued

He still can't figure out what to do with the "superbalance shaft." We think he'll know what he really got, sooner or later. Of course, he should have known what he was getting for his $49.95 when he bought this ridiculous set of devices from the Snake-Oil Storm Door And Better Mileage Company.

GAS CRUNCH

continued

The Backward Mechanic would like to point out that if the station attendant is of the opposite sex (opposite to you, that is) there may be a way of getting gas: cajolery. If this method fails . . .

. . . bring on the "ultimate weapon." Just change clothes and use your feminine wiles/masculine macho to entice the attendant into dispensing his/her liquid gold. Sexist? Yes. Effective? So-so. Better you should use all the gas-saving tips that follow and not get into a position where this dastardly type of conduct is necessary.

The Backward Mechanic's ways to save gasoline may be fun, but these will work better. In fact, you can increase your gas mileage up to 25 percent by following these tips:

keep the engine tuned

Ever been to Niagara Falls? Every minute, 70 million gallons of water flow over. And that's how many gallons of gasoline American car owners waste every week just because their engines are not in top running condition. Over half the cars on the road are wasting about two gallons a tankful because of engine neglect.

keep things clean

A dirty, clogged air cleaner is a robber. Engines use 14 or 15 times more air than gas by weight. A dirty air filter causes you to buy more gas. Check the air filter by holding it up to a light. If you can't see through it, replace it. Never go more than a year without replacing it—do it oftener if you're a high-mileage driver or travel through dusty areas. Replace the oil filter at every change, too.

check tire inflation

If your tires are low, rolling resistance increases gas consumption. This one item alone can cost the average driver over $3 a month in wasted gas, to say nothing of wearing out tires too soon.

take care of the cooling system

Did you know that if the thermostat is stuck in the open position and the engine is running too cool, efficiency may be reduced 7 percent? That could cost you over $4 a month in gas.

(right)
This one is the Backward Mechanic's favorite (probably because of the pretty girls). The only problem we see with this gas-saving tip is that one must continually be on the lookout for low bridges. And, of course, if you have a sedan, there is the extra cost of cutting that hole in the roof . . .

keep the front end aligned

If front wheels are ¼-inch out of alignment, another factor that affects rolling resistance, you are using more gas than you need to.

be "cheap" about using accessories

For short trips and everyday driving, air conditioners are a real drag on mileage. But at freeway speeds, rolled down windows cause aerodynamic drag and so also decrease your mileage. One expert we know says if you have a full-size car, it's better to run the air than to open the windows at freeway speed. Best thing is to keep the windows up and the air conditioner off. Other electrical accessories consume gas indirectly because they actuate the alternator to recharge the battery, which in turn makes the engine work harder.

Don't sacrifice safety to fuel conservation though. If you need the rear window defroster, use it!

think about the load

Car roof racks loaded with luggage cause severe wind resistance and a lot more gas use. If the rack is necessary, pack your items in a wedge shape, putting the smaller ones up front and the larger ones in the back. Do you really need to carry your golf clubs and four-man tent in the trunk all winter?

the DON'Ts of driving

Don't drive with your foot on the brake. A lot of people do it unconsciously. It makes the engine work much harder.

Don't gun the engine when starting; jackrabbit starts at intersections eat up gas.

Don't drive faster than the speed limit. Cars get 21 percent more gas mileage at 55 than at 70. That's two extra gallons in every 10. The most efficient speed in high gear is usually about 45.

Don't idle the engine in the morning before leaving your driveway or in lines at the bank.

HOW IT HAPPENS!

Chief Master Sergeant Gray Eminence is driving through a residential part of the downtown area, rubbernecking as usual. Near a corner he spots a young woman of spectacular proportions standing on the sidewalk talking to a friend. At the next intersection, the light has turned red and the cars ahead of him have stopped. Chief Eminence flattens the front-end of his Volkswagen on a station wagon and cracks the windshield with his head.

Chief Eminence should:

1. Wear blinders, like a workhorse.

2. Keep the neck brace after his neck mends and use it to keep his head faced front.

3. Watch the road and think about women when he can give them his full attention.

4. Not follow so closely those in front of him.

Try 3 or 4. Those are what we mean, although the other two responses suggest the same thing. When you're controlling one or two tons of metal, the last thing you need is a distraction. What makes this example worse is that the good Chief supplied his *own* distraction. If he'd been watching the road, he'd still have the Volkswagen, and the girl would've had to do without the compliment of being a "traffic stopper."

California Study PROBES CAUSES of MOTORCYCLE CRASHES

A motorcyclist's best chance for avoiding crashes is to make himself as conspicious as possible to other drivers; if he does crash, his best chance to survive and avoid serious injury is to have been wearing a helmet. These are the main conclusions of a preliminary report by Harry Hurt, "Motorcycle Accident Cause Factors and Identification of Countermeasures," sponsored by the National Highway Traffic Safety Administration.

The study found that the violation of the motorcyclist's right-of-way by another vehicle was the most frequent cause of cycle crashes. A motor vehicle turning left into the path of a motorcycle was involved in 45 percent of all crashes. Interviews with crash-involved, motor-vehicle drivers indicated that 51 percent of them failed to see the cyclist until it was too late to avoid hitting him.

According to Hurt, one means of combatting motorcyclist "invisibility" is for the cycle rider to wear brightly colored clothing, such as yellow or orange. Another is the daytime use of headlamps. Only 32 percent of the crash-involved cyclists used their headlamps during the day compared to 50 percent of motorcyclists in general.

Hurt's study reports on 900 motorcycle crash investigations and analyzes 3,600 police reports of crashes, all of which occurred in Los Angeles. Other key findings, as reported by Hurt, included the following:

■ The use of a safety helmet is the single most critical factor in the prevention or reduction of head injury. The safety helmet is a significantly effective injury countermeasure

■ Vehicle failures accounted for less than 3 percent of the motorcycle crashes, and most of these crashes were due to puncture flats which caused loss of control.

■ Only 54.5 percent of the crash-involved riders had a current motorcycle driver license.

■ Age of the crash-involved motorcycle rider includes a wide population, with the age group from 17 through 26 representing more than half of all crashes.

■ Alcohol and drug use by the motorcycle rider is present in about 12 percent of the crashes, but is involved in 45 percent of the fatal crashes.

■ The typical motorcycle pre-crash lines-of-sight to the traffic hazard indicate that the limits of peripheral vision did not contribute to the crashes. More than three-fourths of all the crash hazards are within 45 degrees of either side of straight ahead.

■ Safety helmet use caused no attenuation of critical traffic sounds and no limitation of pre-crash visual field; no element of crash causation was related to the safety helmet.

■ More than half of the crash-involved motorcycle riders had less than five months experience with the crashed motorcycle, although the total street riding experience was almost three years.

■ Forty-one percent of the motorcycle crashes were caused by an error of the motorcycle rider. A typical error made by the rider is running wide on a turn due to excess speed or undercornering.

■ Approximately 50 percent of the motorcycle riders in traffic were using safety helmets; 40 percent of the crash-involved riders were wearing helmets at the time of their crashes; 23 percent of the fatally injured riders were wearing helmets; and only one helmeted rider died of head injuries (crushing).

■ Intersections are the most likely place for the motorcycle crash, and the most common crash configuration was the driver of the other vehicle turning left in front of the oncoming motorcycle.

■ The crashes showed significant collision avoidance problems. Most riders would overbrake and skid the rear wheel and underbrake the front wheel, greatly reducing collision avoidance deceleration. (This indicates that there are major, basic deficiencies in motorcycle braking systems. – Ed) The typical crash allows the motorcyclist less than two seconds to complete all collision avoidance action.

■ Seventy-three percent of the crash-involved riders used no eye protection, and it is possible that wind on the unprotected eyes contributed to impairment of vision which delayed hazard detection.

■ Half of the injuries were to the ankle/foot, lower leg, knee, and thigh/upper leg.

■ The crash bar designs on the motorcycles studied were not an effective injury countermeasure. The reduction of injury to the ankle/foot is balanced by the increase of injury to the thigh/upper leg, knee, and lower leg.

■ Fuel system leaks and spill were present in 62 percent of the motorcycles during the post-crash phase. This represents an undue hazard for fire.

■ Four cases (out of 899) of "Band-aid" type injuries attributable to the safety helmet were each associated with accidents in which the helmets protected from severe to fatal head injury.

■ Female motorcycle riders seem to be overrepresented in the crash population; 3.8 percent of the crash-involved motorcycle riders were female, but preliminary exposure data show that female riders are only 2 percent of the riders on the street.

■ The use of heavy boots, jacket, gloves, etc., is effective in preventing or reducing abrasions and lacerations. However, such apparel is effective only at low levels of injury severity.

■ Sixty percent of the riders were not wearing safety helmets at the time of their crashes. Of this group, 26 percent said they did not wear helmets because they were uncomfortable and inconvenient, and 53 percent had no expectation of crash involvement.

■ Groin injuries occurred in 104 of the 899 crashes.

(*STATUS REPORT*, Insurance Institute for Highway Safety)

Timely Topics

FIRE HAZARD

There have been several recent incidents involving '78 Volare station wagons and law enforcement sedans in which engine fires have resulted from the use of the wrong fuel filter. Chrysler (Mopar) fuel filters are metal, but some units have been installing plastic fuel filters in an effort to reduce costs. However, due to the proximity of the fuel filter to the exhaust manifold, the plastic filters melt or crack and allow gasoline to spew onto the hot manifold and cause a dandy fire. An MDR (Material Deficiency Report) has been filed on this problem, but users and fixers of these cars would probably do well to make a quick check of their cars and their stock of filters to make sure only the metal fuel filters are used. It might be a good idea to check all your vehicles for this type of problem. Fires are always dangerous and usually expensive . . . so why not take a quick peek under the hood and save yourself some time and trouble?

CONVICTION INTERVALS

A study of the driving records of motorists convicted of driving under the influence of alcohol has shown that the interval between convictions decreases each time a driver is convicted. Researchers at Vanderbilt University in Nashville, Tenn., found that the interval decreases from two years between the first and second conviction, to 17 months between the second and third convictions, to 11 months between the third and fourth convictions, to eight months between the fourth and fifth convictions.

FIRESTONE 500 TIRE RECALL

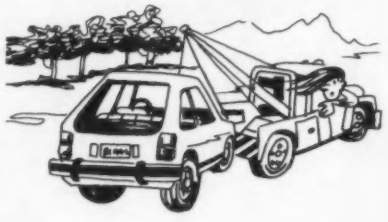
Firestone Tire and Rubber Co. has announced that all owners of Firestone 500 tires had been notified of the recall by the end of August. As of June 30, the company had replaced more than 3.1 million tires: about 2.4 million were provided free and 700,000 were replaced at half price. Firestone was criticized by NHTSA administrator Joan Claybrook during a House subcommittee hearing last June on the agency's tire recall program. Asserting that a vast majority of Firestone 500 owners had not received notification letters at that time, she urged the company to step up the pace of the campaign with media notices and letters.

TOWING

The Auto Club recently reminded its members that owner-made modifications to their cars can be the cause of real inconvenience when towing becomes necessary.

Tow trucks that respond to roadside emergencies normally are equipped with a towing sling—a pa of metal bars connected by two flexible rubber belts. Most cars, as manufactured, are quite adaptable to the towing sling, but modifications can lead to damage to the car, extra charges for special towing equipment, or absolute inability to tow.

A car's bumpers, both front and rear, are an important interface between the tow truck and the car itself. Obviously, removing a bumper almost always makes it impossible to tow the car. Non-factory bumper guards added for extra protection in fender-benders can actually aggravate towing damage. Auxiliary fog lights installed under the front bumpers result in the same towing difficulty. Some trailer hitches cause problems when a rear-end tow is attempted.



Also, whenever the underside of the front bumper is not kept clear, towing problems become apparent. This is particularly critical on front-wheel-drive cars since many can be towed only from the front. In fact, all such vehicles *should* be towed from the front whenever possible.

Spoilers—or air dams—that mount on the body panels under the front bumper can cause towing difficulties, too, and are best left to race cars where they're needed for improved road holding at high speeds. On everyday passenger cars, they're a stylish gimmick that only serves to inhibit towability, says the Auto Club.

So should owners totally avoid personalizing their cars? Not necessarily. Just take into account the possible consequences. It's best to know the score before that tow truck shows up.

DON'T DETONATE THE BOMB UNDER YOUR HOOD

Don't look now, but there's a bomb under the hood of every vehicle. Installed by the manufacturer, that bomb is a deadly anti-personnel device that can explode with a blast of lead and corrosive acid.

Many drivers may be unaware of the explosive potential of that bomb—the innocent-looking lead storage battery. A fully-charged battery, or one in the process of being charged, generates hydrogen gas. As little as four percent in a mixture of air can be explosive. In addition to the explosion itself, the erupting battery acid can cause damage and painful injuries, especially to the eyes and face. Wear eye protection.

Studies of actual cases indicate that the most frequent causes of battery explosion are:

1. Installing a fully-charged battery in a vehicle with some of the switches on, or crossing cables.
2. Fastening cables to a battery post which is broken internally.
3. Filling a warm battery with distilled water, if a spark is present.
4. Checking the water level of a battery with a match.
5. Connecting a battery to a charger that is turned on, or removing the battery before the charger is turned off.

Treat a battery with respect and avoid ignition sources. If you are sprayed with battery acid, flush eyes and face with water; then get medical treatment immediately. Your eyesight may be at stake.

DOUBLE CLUTCH

continued from page 2

Kline says if the body builder can make motor homes lighter and cleaner, the chassis builder can improve fuel economy another 15 percent by using lockup torque converters, lower axle ratios, and smaller engines. Rolling resistance can be cut with the use of radial tires. Cooling system losses can be reduced by de-clutching fans. No doubt other efficiency gains will turn up as the industry progresses.

Of course, the final package must come in at a price the average family can afford. Kline doesn't believe the RV market will ever return to 100% of what it was in recent years, but he does believe that if chassis builders and body manufacturers cooperate, there is still a rosy future.

The Backyard Mechanic

A GUIDE TO CONSUMER SURVIVAL

AVOIDING THE TUNEUP RIP-OFF

You can already feel the heartburn coming. You're stock piling antacids in the top desk drawer. The old car is giving you very strong hints that it's ready for another tuneup. It's getting harder and harder to start. The buggy stalls no matter what you do. She's burning gasoline as if it were 25 cents a gallon. The acceleration is so poor, Boy Scouts ask if you need help getting across the intersection. (Or maybe you're the type who tunes up every 10,000 or so miles as routine?)

Any way you look at it, the engine needs a tuneup and you *know* the whole thing is going to take its toll on you.

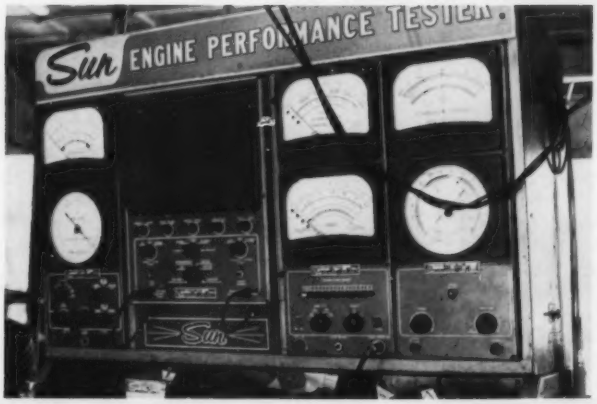
Generally your mind is racing with one of two tuneup rip-off scams:

1) The mechanic will fix only enough to get your car back out the door with a property line guarantee: once you drive across the property line, he never wants to see you again. The problem being the car may not run long enough to get you out of his sight. If he does provide a guarantee, you end up taking the vehicle back every other week to get it "fixed right this time." Or until you're sick of talking to him with your teeth forced together, eyes shut and general body shakes. Then you give up and pay to have it done again, someplace else.

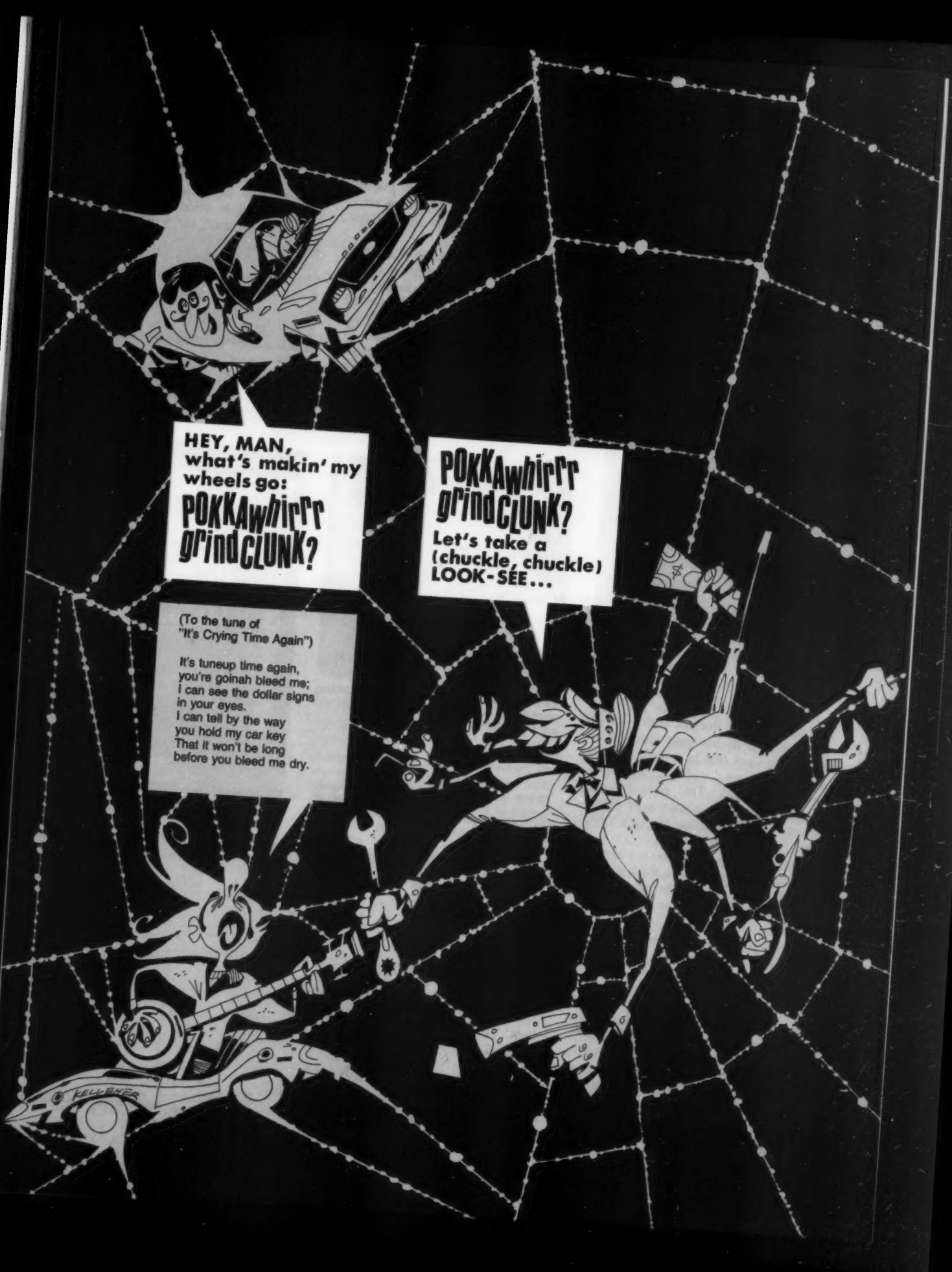
2) They say they can do it for $50. However, once the car is in the shop and they've got it apart the bump-up starts. The sincere mechanic comes to you wiping his hands on one of those red rags, shaking his head saying something about, "Well, we found this

continued

Spark plug wires can look perfectly OK clean or dirty, but may be electrically unusable. Remember, when pulling your own wires from the spark plugs, rotate them until they "pop" before pulling them loose. Jerking them away from the plugs can ruin the wires.



(left) **Air filters** are usually one item that you can readily check to see if you got what you paid for. No amount of air blasting is going to turn the used filter on the right white like the new one on the left. (right) **If the mechanic** you pick doesn't have a set of test instruments like this—boogie. He's not going to be able to do a proper tuneup.


HEY, MAN, what's makin' my wheels go: POKKAwhirrr grindCLUNK?
POKKAwhirrr grindCLUNK? Let's take a (chuckle, chuckle) LOOK-SEE...
(To the tune of "It's Crying Time Again")
It's tuneup time again,
you're goinah bleed me;
I can see the dollar signs
in your eyes.
I can tell by the way
you hold my car key
That it won't be long
before you bleed me dry.
KELLEHER

continued

The parts man can be your ally. Shop for a reputable one just like you would for a mechanic.

wrong." And it doesn't seem like 10 minutes after he has your approval for $25 more work that he's back with another "Well, we found . . ." and wanting another $25. This goes on until they're bumped you into a $100-plus minor tuneup or even the sky's-the-limit major tuneup.

But one thing is for sure when it's tune-up time: most of us *think* it's also rip-off time. It's as though tuneups were magic, but there are no magicians to perform the tricks.

It doesn't have to be that way. There are ways to insure that your vehicle gets the work it needs, and only the work it needs. At the same time, you can rest assured the tuneup lasts a reasonable length of time. This is true for not only the work you have done for you, but the work you do yourself.

Basically, there are two types of tuneups. There's the routine tuneup that should be done periodically. That is, a tuneup to solve a problem that has developed over a period of time. For example, the car accelerates slower than it did before, the gas mileage isn't as high as it once was, the engine is harder to start, the car stalls, or maybe, it's been more than 10,000 miles since that last tuneup. These are all hints that it is tuneup time.

The other type of tuneup is really a repair. It's done to solve a problem that developed suddenly. For example, the engine starts missing, the car's running rough, or it won't start at all. These are problems that a tuneup might solve.

In either case, unless it is a real emergency don't settle for just one opinion. Get a second opinion. Most reputable shops will provide an opinion free. Some may even charge $5 to $10 for putting the car on a scope to find exactly what's needed. Keep in mind that most manufacturer dealership service shops will charge $17 to $35 just to look at your chariot. So unless you're very sure the work is going to come under your new or used car warranty, you can get it for less.

Of course, the key is finding a reputable shop with a competent mechanic. A mechanic you can have confidence in.

Your question being, "If I'm new to the area, how do I find such a person?"

The answer is simple: Ask. Ask, "Where do you have your work done?" and "Are you pleased with the job?" Ask the people you work with. Ask the

Our Promise
We do professional work.
We satisfy the work we authorize.
We return worn out parts.
We honor our warranty nationwide.

Even if you're not concerned about getting everything you paid for, always get your old parts. It is peace of mind.

(right, below)
There is a time when the new carburetor is more of a bargain than the rebuilding kit. Usually, the parts seller knows when that is, and isn't just bumping you up.

This piece of equipment checks out electronic systems with *good* or *replace* lights going one, two, three, four, five and six. You have to have one to properly check out the new systems. However, the $200 price tag is too steep for most Backyard Mechanics.

auto hobby shop staff. Ask people using the auto hobby shop. Find out what different people have to say about where they get their work done and, especially, by whom. And get more than one opinion.

If you're really lost, go to a big organization. Any of the major service centers such as Goodyear, Firestone, B.F. Goodrich, Midas, Sears, Penney's, Ward's, etc. are good. These larger organizations give a little more. They are a little more understanding than the one-man organization just down the block. Besides you have a little more pull. You can always take your problem to upper management. Try that with the owner-operator-chief mechanic-grease monkey-gas-pumper-and-general go-for at the corner gas station.

Another plus to the big organization is their national operation. Generally they will honor the warranty at any store in the chain, even though it's on the opposite coast.

However, the independent mechanic can be just as good as the big organization,, and in some cases a lot better. There can be many reasons why his business is not as large as the service center's. For one, he may not take credit cards, demanding cash instead. Perhaps he's already got all the business he wants. Or maybe he's a true professional and wants to be able to assure his customers of his personal touch on every job.

That's why it is important to find out what different people have to say about the service they've received.

Other clues to a mechanic's competence include cleanness of the establishment and working area.

Next, you might want to look for certification of the mechanic's abilities, whether it be a wall covered with "diplomas" or a sleeve-load of stripes to make any Army sergeant major jealous. This is a mechanic with experience and a source of reference. If he has gone to the trouble of passing courses, he's concerned about what he's doing—not just making a buck.

You also want to know if the proper equipment is available to handle your vehicle. If the tuneup technician doesn't have an infra-red, a scope and the proper tools, he's not going to be able to tune today's cars properly. Without this equipment, the mechanic can only guess about what's wrong. With the equipment and proper training in its use, he can pinpoint the problem.

If one thing goes wrong, it could indicate 100 other problems. Only an experienced mechanic can come to the right solution. And with today's complicated vehicles only an experienced mechanic with a scope can find the real problem.

For example, one of the plug wires has been burned by the exhaust manifold and the engine starts missing. It's missing so bad it sounds and feels as though it were about to self-destruct. Very few people think, "I've got a miss, and I can get out of it for $2." Therefore, they have already prepared themselves for the inexperienced, unscrupulous "operator" who says they need an entire set of wires, plugs, points, and may even toss in a carburetor overhaul to sweeten the price.

Whatever you do, don't walk into a shop and say, "I need all this: I need wires; I need this; and this; and this . . ." All you're doing is laying yourself open for the works.

Women may have been the real targets of the tuneup rip-off in the past because of their stereotyped lack of knowledge. However, with today's complicated vehicles almost anyone can be pulled into the trap. On the other hand, if you can assert yourself—let the mechanic know that you're no push over—then you're less likely to be taken. If you're too passive, take somebody with you who is more aggressive.

If you're concerned about paying for a part you didn't get, ask for your old parts back. Some firms make this a practice; you should make it a habit.

Probably the "grayest" area regarding paying for something you didn't get is the carburetor overhaul or installation of a rebuilt fuel/air mixer. This is because it is very, very difficult to tell the differences between a rebuilt or overhauled carburetor and one that has just been cleaned. This is why you must pick a mechanic you trust.

Did you need everything you paid for? Again, it's hard to say. Let's look at a distributor cap example and then you tell me.

The first mechanic did a complete $100 tuneup, but only wiped off the cap. Two weeks later it arced across and the car stopped running. You never heard an owner cuss out one mechanic so much for not getting his problem fixed.

Another mechanic with a similar tuneup noted that the distributor cap didn't need replacing that very minute. But there was some carbon build-up and carbon tracks that he thought might cause a problem in the future. After finding too much resistance on the scope, he decided that the cap could cause a problem before the car came back for another tuneup—15,000 to 20,000 miles later.

Knowing that the customer would say, "I spent $100 and have a problem within a month" if something went

continued

Fuel filters can be a very effective tuneup addition, especially if you just completed some carburetor work.

These cleaning chemicals can sometimes solve minor tuneup problems for a short period until there's time to do the job right. They should also be used to clean the carburetor and PCV periodically.

(right)
An electronic ignition module is an expensive item to replace. It becomes even more expensive if you don't read the directions and overheat the unit because you forgot to use the insulating material in the white tube.

wrong, the second mechanic replaced the cap. He also rationalized, "People forget the price . . . as long as they get proper service."

The difference between the two jobs: $6.

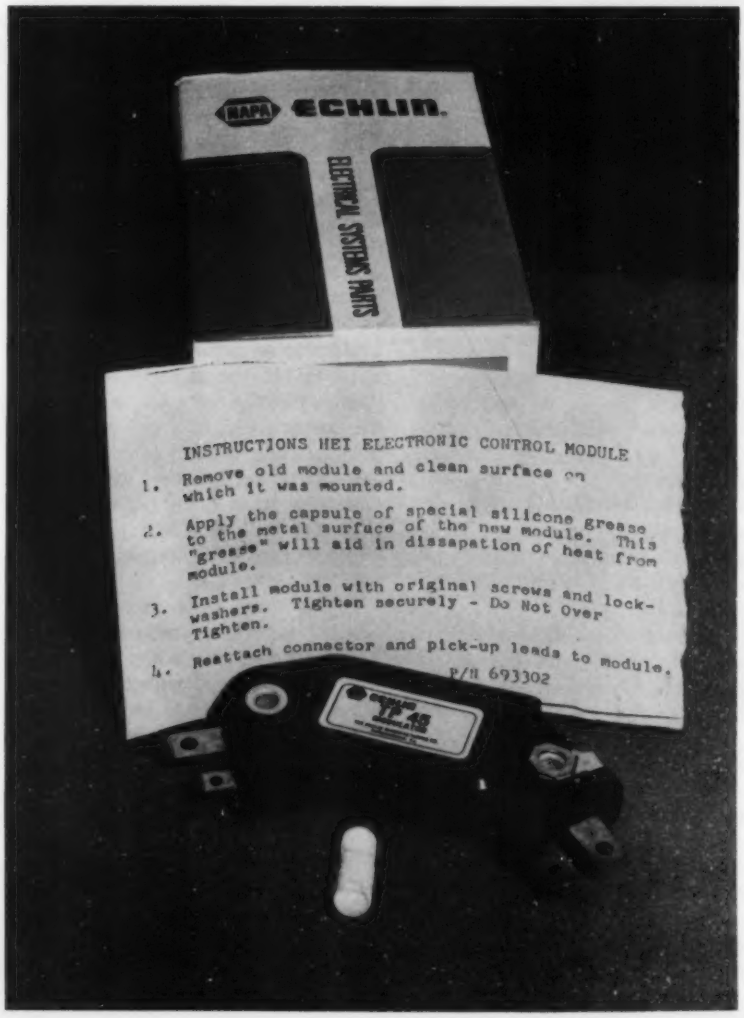
The bottom line for reputable mechanics: they depend on repeat business. Unless they're out in the desert somewhere—then they can depend on one-shot deals. Besides, good work compounds itself in word-of-mouth advertising. After all, that's how you discovered them.

Do it yourself: In the world of do it yourself, the parts counter person is going to be as important to your tuneup as the mechanic is when you take your vehicle to the shop. And you should shop for a parts sales representative the same as you would a mechanic—ask around until you find a reputable one you can trust.

If you're wondering why you need a reputable parts seller when you're doing the work yourself, the answer is simple. He can steer you in the right direction as easily and as quickly as a bad mechanic can empty your pocketbook.

While it is possible for a parts seller to oversell you on what you need, your biggest worry should be that you might be undersold. Here's what happens:

You go in and say you're tuning up your '69 Dodge Dart. The dealer sells


NAPA ECHLIN
ELECTRICAL SYSTEMS PARTS
INSTRUCTIONS HEI ELECTRONIC CONTROL MODULE
1. Remove old module and clean surface on which it was mounted.
2. Apply the capsule of special silicone grease to the metal surface of the new module. This "grease" will aid in dissapation of heat from module.
3. Install module with original screws and lock-washers. Tighten securely - Do Not Over Tighten.
4. Reattach connector and pick-up leads to module.
P/N 693302

you points, condenser, plugs, and asks if you need a rotor, cap and wires. If you stop and think about it, for the tuneup to work, everything has to be right. You may also need a pollution control valve, air filter, fuel filter, emission control filter . . . See what I mean?

What else can a good counter person provide? Troubleshooting assistance, that's what.

You've got a problem in your new electrical ignition system. Mr. Bad Guy sells you the whole control module for $45. However, Your Friendly Fellow knows all you need is a rotor because he's been keeping up with the literature.

continued

(left)
There aren't many special tools needed to do a basic minor tuneup. Gauges for the points and plugs and a distributor tool will usually be enough in addition to the normal wrenches and screw drivers. But don't forget a spark plug socket saves a lot of broken plugs.

(below)
Wires, wires and more wires. Be sure to get the right set for your vehicle and motor.

Tuneup kits and parts are usually available anywhere. However, beware of 99¢ spark plug specials—you'll get what you pay for—very little.

Mr. Y.F. Fellow also listens to you when you come in. What he's looking for is to hear if you sound like you know what you're doing. If you don't, he's going to help you all he can—even to the point of sending you elsewhere.

You came in asking for a carburetor rebuild kit and he bumped you to a rebuilt carb or even a new one. Did he oversell you?

Probably not. Unless you're a real pro, rebuilding is not for you. And unless the parts seller is sure you know your problem is the carburetor, he may not be bumping you with the new model. You see, if he sells you a rebuilt, but there is another problem with the car, the car still won't run correctly. At that point you'll think it is the rebuilt carburetor he sold you. You'll take it off and return it. However, if it is a new carburetor, you'll realize there must be something else wrong and look further. Got the picture?

Also, the carburetor, whether you rebuilt it, the factory rebuilt it, or it's brand new, isn't going to work well unless you changed that old dirty fuel filter, too.

Are you beginning to get the full picture?

Now, if you are really into this Backyard Mechanic bit, your local parts store is going to help even more. More help because they also provide clinics on new systems. Clinics that are not only open to the public, but are also free. Even if there is a fee, it usually covers the cost of manuals handed out or equipment provided. For example, with an air conditioning clinic you usually get your own set of test equipment.

Parts sellers also have the latest information on the latest systems available, such as the new fit-in-your-palm electrical fuel pumps, or even the $200 plug-in electronic ignition tester that gives you *good* or *replace* light signals one, two, three, four, five and six.

You should also expect your parts seller to provide you with all the specifications you need to do the tuneup at the time of the sale. If you forget the specs, he should be willing to read them to you over the phone.

And finally, don't be insulted when he gives you these last words of wisdom, "Read the instructions." Automotive technology changes so rapidly you never know when you're going to mess up doing something you've always done because it isn't done that way anymore.

Is he a reputable mechanic you can trust? Ask around and find out what people have to say about him. It'll pay in the end.

DRIVER wishes to thank Tom Miklosovic, Aron Durham and Frank Cardone of Goodyear Tire Co. and Joe Hallett of Action Auto Parts, San Bernardino, Calif., for their assistance in the preparation of this article.

motorcycle course

U.S. Army photos
by
Spec. 5
DENISE DUDLEY

An Advanced Motorcycle Defensive Driving Course student tackles one of two Fort Bragg, N.C., obstacle courses with hopes of leaving all traffic cones standing.

"Students love it," says Fort Bragg, N.C. Motorcycle Safety Course instructor Wayne Graham, "and many times we can't even get them off the bikes." *It* refers to a mandatory motorcycle class that is neither boring nor a place to catch 40 winks.

All military, dependents and civilian employees who own or operate motorcycles on the North Carolina U.S. Army reservation are required to take the course. Retired military and their dependents may also attend.

Actually, there are two courses. One for people who don't yet have their own bike but who have plans of buying one or just want to learn how to ride. The other for experienced riders or those already owning bikes. Some beginner course students have been so enthusiastic that they turned around and signed up for the advanced program.

So Graham can work with each student individually, the beginner course is limited to four students. As there are four brand-new bikes for beginners to learn on, all students need furnish is a helmet.

Although classes are pretty informal, beginner course graduates (yes, they do take tests) are given diplomas from Fayetteville Technical Institute. Advanced course graduates receive wallet-size certificates which they must carry while operating a cycle on post.

In addition to learning the different motorcycle parts, proper riding clothing and equipment, and viewing films and slides, basic course students drive an obstacle course. Students are also taught how to ride in various weather conditions and are provided with North Carolina state motorcycle operating rules. Literature about other states' laws are also available.

"Five people have been killed in motorcycle accidents on Fort Bragg since October 1978. There have also been some 37 injuries," Graham notes. Then he interjects, "The students seem very involved in safety and that's what we encourage."

Fort Bragg motorcycle instructor Wayne Graham points out details of an obstacle course as students prepare to qualify.

LETTERS to the EDITOR — BACKfire

A NEW FEATURE?

In the light of driving safety, fuel economy, and maintenance safety, DRIVER could gain from its readers by adding a feature on a monthly basis. The feature could work hand-in-hand with your "Backfire" department and could be enjoyed by the readers through their own participation.

Many GIs throughout the Armed Forces are active members in street rod clubs, motorcycle, van or RV clubs. These people spend countless hours building these machines with safety and performance in mind. By opening a column for this, other readers can benefit by their success or failure on certain projects.

You, as a magazine, could feature a photo and by-line of the car, or bike, or whatever of the month.

This is not to suggest that you try to go into competition with the custom magazines; most GIs don't have that kind of money to build a "High Dollar" vehicle.

Before you throw this in the trash, or file it under "PUSH," stop and think for a minute what these backyard mechanics have given the world. Like seat belts, sway bars, roll bars, crash bars (mechanics love "bars"), and a lot of other gadgetry to improve safety and performance.

All of us here at the "Cow Patch" love your mag and read it monthly. Keep up the good work and keep those features comin'.

Mr. Doug Gildroy, USAF
57th Mil Alft Sq
Altus AFB, OK 73521

What do you think? Is there enough interest? Who would like to start it off? Send us your black-and-white glossy photos and comments about your car.

CHOCK THOSE WHEELS

Your article "Vacation Planner" was excellent (May '79 issue). I really enjoyed the depth to which the author went. With Christmas travel coming up, this type of vehicle preparation will be a common occurrence.

In the area of safety there are a few precautions that a backyard mechanic should take when working under a vehicle. The following is a description of a near-fatal accident. I was preparing my car for a vacation trip by checking for leaks in the various systems. My wife had complained on several occasions that the power steering was not operating properly. During my inspection, I noticed a leak around a seal in the power steering unit. Without hesitation and with safety in mind, I pulled the car up on commercially constructed ramps, placed the selector lever in park, applied the parking brake, and put jack stands under the car as an added precaution.

The power steering unit took nearly two hours to remove due to its location, and it was a frustrating experience. I was lying under the car trying to decide what to do next when I noticed the left front tire began to move. There was nothing I could do; the car rolled down on top of me. I thought I was dead! By the time the car stopped rolling, the front left tire was lodged tightly against my right side, between the hip and the lower rib cage. Realizing at this point that I was not dead, I began to yell for help. My wife appeared after the second scream. She started to leave for help, but I asked her to chock the rear wheels and attempt to raise the car. She was able to lift the car about two inches, which was enough to free me.

As a result, I sustained some very painful bruises and abrasions but no broken bones. This type of accident is not uncommon, and should be brought to the attention of every would-be mechanic. If you work under a vehicle that has any of its wheels on the ground—*CHOCK THOSE WHEELS.*

Super-lucky at Randolph AFB.

SSgt Willis H. Lipham, USAF
Det 2, 1400 MAS
Randolph AFB, TX 78148

LIFE-SAVING TIP

Here's a motorcycle riding tip that could save your life. You may be booking down the highway and accidently strike a small object—be it small animal, rock, or piece of wood. Depending upon your speed, you can become airborne and come down crossed up. Your handlebars will be moving left to right to left, almost lock to lock, and you just can't muscle the cycle back straight.

As your life rushes through your mind, think of this: Throttle off, tap only the rear brake on and off, on and off, Tapping the rear brake will pull your cycle straight and settle down the handlebars.

I know—it happened to me and I saved it. I hit an armadillo (hard as a rock) doing about 75 mph (back in the old days). Either instinct or having read about that technique saved both serious injury and my life. Should this happen to you, there is no time for daydreaming, you have to react instantly. A motorcycle just will not stay upright too long when the front end is cycling back and forth.

TSgt James L. Shipp, USAF
6911 SSM Box 1923
APO New York 09109

HEADS, YOU LOSE

Another comment regarding your Feb '79 article, "Helmets and Broken Necks." This, in response to PRAN J.T. Henderson with the unknown address. My father was a motorcycle enthusiast back in the early 30s. He was very "into" cycles at that time and I have heard, maybe incorrectly, that he developed the buddy seat for Harley. I remember, as a small child, being seated in front of my dad, clutching the gas tank of a big Harley or floating along in the side car of an Indian as we whizzed around Yonkers, N.Y., and usually at night. So I know the "free" feeling of being windswept. My father was also killed in a car-cycle accident (leather helmets were the thing then, you know).

I agree with practically everything

Mr. Henderson said in his letter to you (Jun '79 DRIVER). In my opinion, motorcyclists are more alert, they respond faster and take better care of their machines than do car owners. And 80 to 90 percent of car-motorcycle accidents *are* the car driver's fault. Interestingly, the majority of motorcyclists are male, unmarried drivers under 25 (in the highest accident-risk group). But, Mr. Henderson, the bottom line is this: In 100% of car-motorcycle accidents, the motorcyclist is the loser! He rides a 300- to 400-pound machine, totally exposed, into a situation where he is pitted against another driver, surrounded and protected by one to two *tons* of metal. We're not talking here about personal freedoms, we're talking common sense. And you know, in this case, "heads" will lose.

Mr. Guy McAllister
3723 Jamestown Drive
Huntsville, AL 35810

BATTERY CHARGING

I try to read every issue of DRIVER from cover to cover at least once, twice if I can keep it that long. I think that you have one of the most informative and driver-related publications in print today.

Regarding the April '79 DRIVER article "Jump Starts," you forgot one very important step—the trip to the local garage, service station, hobby shop, etc., to get the vehicle's electrical system and battery completely checked out by a qualified mechanic or under the supervision of a qualified mechanic, as well as getting the battery (if it's serviceable) completely charged.

The alternators in today's cars, unlike the generators of a few years ago, are *not* designed to recharge a dead or very weak battery. They are only designed to keep a fully-charged battery fully charged. Trying to charge a dead or weak battery using the vehicle's charging system can result in severe damage to the vehicle's charging system.

I am, by the way, a fully-qualified automotive mechanic and I am currently employed parttime by the J.C. Penney Co. as an automotive repair technician (a fancy name for a mechanic). I have replaced a number of alternators that were damaged because the vehicle owner tried to charge a dead battery using only the alternator. I have made it a habit to give the vehicle owner the little card that is on the hot post of the alternator, the one that says "Install only on vehicles with a fully-charged battery or alternator damage may result."

Keep up the excellent work.

TSgt Paul R. Tranbarger, USAF
Route 7, 1449-A Grissom Court
Valdosta, GA 31601

LAUGHING AND LEARNING

I have just finished reading your July '79 issue of DRIVER. I found it to be quite informative and enjoyed it thoroughly (as usual). I was especially impressed by the "Exercises for the Backward Mechanic" supplement. Being able to educate people and make it enjoyable is a rare talent and an excellent morale booster. Thanks for a job well done!

Still laughing (and learning).

Sgt Robert J. Beheler, USAF
323 FTW/OIA
Mather AFB, CA 95655

PASSENGER AND CO-PILOT

I just got through reading an article in your August '79 issue called "The Passenger As A Co-Pilot." Every time my wife and I drive to New York and back, or for any long period of time, I consider her my co-pilot. One cannot drive and read a road map at the same time, though I've seen it attempted.

Also, it is true what you say about your co-pilot perhaps seeing things that you can't. I think people should get used to the fact that back-seat drivers (or should I say co-pilots) can be very useful. Just think, if every car had a co-pilot there would be fewer accidents. I'm just happy to see that I'm not the only one that likes to use the term "co-pilot" on a long or short driving trip. After all, two heads are better than one!

Cpl Russell M. Klyvert, USMC
A Co., Hq Bn.
Albany, GA 31704

"E" FOR EFFORT

Your article "'A' for Effort" in the August '79 DRIVER was thoroughly enjoyed and welcomed, but someone's efforts didn't deserve an "A." Check the photo of MSgt Cousins performing "final touches to a carburetor" and you'll discover that his hands are next to the distributor, way above the carburetor.

Next, what do you mean Model A's don't have tail lights? Your photo even shows one on the left rear fender (standard equipment). An optional tail light is available for the right side if desired.

Third, those classic headlights you pictured are seal beam lights, which are in no way classic when compared to the original Ford script lens.

Fourth, if leaving the fuel shutoff on causes carburetor flooding, there's something wrong with the carburetor (i.e., float valve stuck).

The Model A is a lady deserving of more respect and credit than your article gave her, but then who can do justice to a car that has been on the road for 50 years?

Capt T.R. Fox
MCAS Yuma, AZ

Nobody on the staff knows a thing about these old beauties, so we took the author's word for everything. We thought that was a brake light in the picture, which shows what we know!

Address your letters to:
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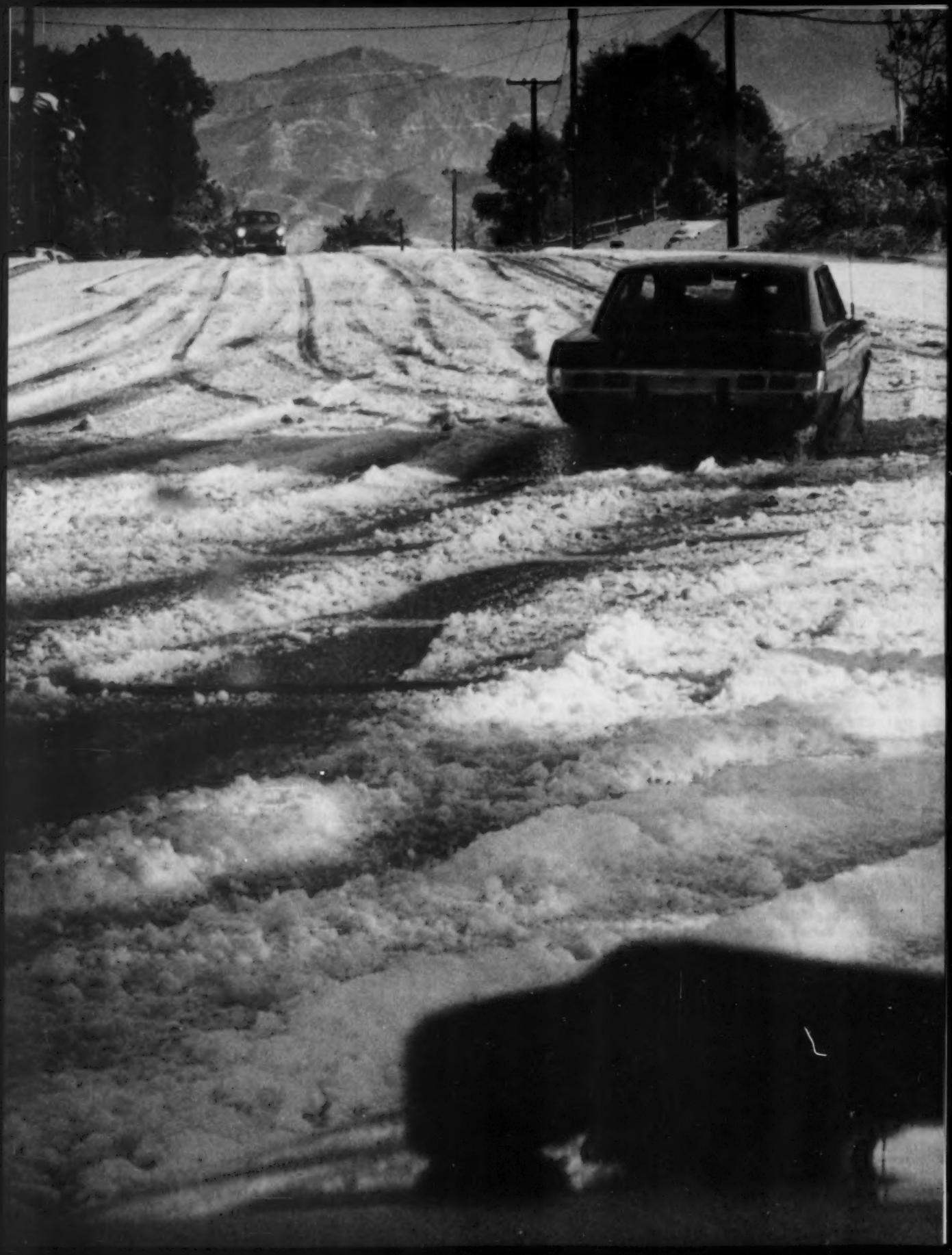
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